

Modification proposal:	<b>Grid Code GC0129: Updating the Grid Code to use Engineering Recommendation G5/5 - Harmonics</b>		
Decision:	The Authority <sup>1</sup> directs <sup>2</sup> that the proposed modification to the Grid Code be made		
Target audience:	National Grid Electricity System Operator (NGESO), the Grid Code Review Panel, Grid Code users and other interested parties		
Date of publication:	17 December 2019	Implementation date:	17 June 2020

## Background

The modification proposal, Grid Code GC0129: Updating the Grid Code to use Engineering Recommendation G5/5 - Harmonics ("the modification proposal") was made in order to update references in the Grid Code<sup>3</sup> to Engineering Recommendation (EREC) G5 ("EREC G5").

EREC G5 defines planning and compatibility levels for the assessment of voltage distortion from Users<sup>4</sup> equipment and installations with harmonic emission to be connected to transmission systems and distribution networks in the United Kingdom. It forms part of Annex 1 of the Distribution Code,<sup>5</sup> "Qualifying standards," which outlines distribution network technical requirements.

EREC G5 is being updated as the result of a working group and public consultation<sup>6</sup> held by the Distribution Code Review Panel (DCRP). The updates to EREC G5 will result in a new version of EREC G5 being published, EREC G5 issue 5 (EREC G5/5).

The Grid Code references EREC G5 in several places. The current references in the Grid Code are to EREC G5 issue 4 (EREC G5/4)<sup>7</sup> and do not reflect the updates that will be made to EREC G5 and contained in EREC G5/5. The modification proposal seeks to align the references in the Grid Code with EREC G5/5.

## The modification proposal

The modification proposal was made by NGESO and submitted to the Grid Code Modifications Panel for its consideration on 30 May 2019. NGESO maintain and administer the Grid Code.

The Grid Code Review Panel (GCRP) unanimously decided to send the modification proposal straight to Code Administrator Consultation ("the Consultation") for 15 working days once there was sufficient certainty on the corresponding change to the Distribution Code. The changes to EREC G5 in the Distribution Code are being implemented in parallel

<sup>1</sup> References to the "Authority", "Ofgem", "we" and "our" are used interchangeably in this document. The Authority refers to GEMA, the Gas and Electricity Markets Authority. The Office of Gas and Electricity Markets (Ofgem) supports GEMA in its day to day work. This decision is made by or on behalf of GEMA.

<sup>2</sup> This document is notice of the reasons for this decision as required by section 49A of the Electricity Act 1989.

<sup>3</sup> <https://www.nationalgrideso.com/document/33821/download>

<sup>4</sup> The Grid Code defines "User" as "persons using the national electricity transmission system." This definition varies in each section of the Grid Code but can mean "any person to whom the Grid Code applies."

<sup>5</sup> [http://www.dcode.org.uk/assets/files/dcode-pdfs/DCode\\_v43\\_14112019.pdf](http://www.dcode.org.uk/assets/files/dcode-pdfs/DCode_v43_14112019.pdf)

<sup>6</sup> [http://www.dcode.org.uk/assets/uploads/DCC\\_DCRP\\_G5-5\\_Consultation\\_paper\\_final\\_2018-08-01.docx](http://www.dcode.org.uk/assets/uploads/DCC_DCRP_G5-5_Consultation_paper_final_2018-08-01.docx)

<sup>7</sup> [http://www.dcode.org.uk/assets/uploads/ENA\\_ER\\_G5\\_Issue\\_4\\_Amendment\\_1\\_2005\\_.pdf](http://www.dcode.org.uk/assets/uploads/ENA_ER_G5_Issue_4_Amendment_1_2005_.pdf)

to the modification proposal.<sup>8</sup> The only response to the Consultation agreed that the modification proposal better facilitates Grid Code objectives (i) and (iii).

The GCRP recommend the implementation of the modification proposal to update the references in the Grid Code to EREC G5, in order to align the Grid Code with new requirements contained in EREC G5/5. It is also recommended that the text and diagrams in EREC G5/5 should not be duplicated in the Grid Code and that the Grid Code should only reference EREC G5/5.

The modification proposal will be implemented by reviewing the current baseline Grid Code for references to EREC G5/4 and Electromagnetic Capability Level. The modifications to the Grid Code are outlined below:

- Update the definition of “Electromagnetic Compatibility Level” to reference EREC G5 instead of EREC G5/4.
- Define “Engineering Recommendation G5” in the Grid Code glossary and re-direct this term to EREC G5/5.
- Update references to EREC G5 from EREC G5/4 in:
  - Planning Code
    - Appendix C – Technical and design criteria; Part 1 – SHETL’s technical and design criteria, item 6
    - Appendix C – Technical and design criteria; Part 2 – SPT’s technical and design criteria, item 6
    - Appendix E – Offshore transmission system and OTSDUW plant and apparatus technical and design criteria, item 3
  - Connection Code
    - CC.6.1.5: Technical, design, and operational criteria - voltage waveform quality.
  - European Connection Conditions
    - ECC.6.1.5: Technical, design, and operational criteria - voltage waveform quality.
  - Operating Code No. 5
    - OC.5.5.4: Procedure for testing – test and monitoring assessment

It is proposed that the modifications to the Grid Code should be implemented concurrently with the changes to EREC G5 and the Distribution Code. This will align the Great British (GB) framework and should lead to an efficient and coordinated solution.

### **Grid Code Review Panel recommendation**

On 12 November 2019, the GCRP issued a Final Modification Report (FMR) to the Authority. The FMR recommends replacing references to EREC G5/4 in the Grid Code with references to EREC G5.

The GCRP do not expect the modification proposal to impact consumers directly and no costs are foreseen in relation to its implementation.

### **Our decision**

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<sup>8</sup> <http://www.dcode.org.uk/dcode-modifications/2019-modifications/>

We have considered the issues raised by the modification proposal as contained in the FMR. We have also taken into account the responses to the industry consultation on the modification proposal which are included in the FMR.<sup>9</sup> We have concluded that:

- implementation of the modification proposal will better facilitate the achievement of the objectives of the Grid Code;<sup>10</sup> and
- approving the modification proposal is consistent with our principal objective and statutory duties.<sup>11</sup>

### **Reasons for our decision**

We consider that the modification proposal will better facilitate Grid Code objectives (i), (ii), (iii), and (v) and will have a neutral impact on all other objectives. Our view differs slightly from the GCRP's view in the FMR that only objectives (i) and (iii) will be better facilitated by the modification proposal.

#### ***(i) to permit the development, maintenance and operation of an efficient, co-ordinated and economical system for the transmission of electricity***

The modification proposal aligns requirements in the distribution and transmission codes. Standardising these requirements across voltage levels provides clear guidelines for connecting to and using the national electricity transmission system (NETS). In particular, updates to references to EREC G5 in the Planning Code promotes the development of a more efficient, coordinated, and economical transmission system.

For the reasons set out above, we consider that the modification proposal will better facilitate Grid Code objective (i).

#### ***(ii) to facilitate competition in the generation and supply of electricity (and without limiting the foregoing, to facilitate the national electricity transmission system being made available to persons authorised to supply or generate electricity on terms which neither prevent nor restrict competition in the supply or generation of electricity)***

The modification proposal aligns requirements in the distribution and transmission codes. Updated references to EREC G5 in the Connection Code and European Connection Conditions levels the playing field for connection costs by standardising requirements across voltage levels. This lowers barriers to entry for connecting to, and using, the electricity network and promotes competition in the generation and supply of electricity.

For the reasons set out above, we consider that the modification proposal will better facilitate Grid Code objective (ii).

#### ***(iii) subject to sub-paragraphs (i) and (ii), to promote the security and efficiency of the electricity generation, transmission and distribution systems in the national electricity transmission system operator area taken as a whole***

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<sup>9</sup> Grid Code proposals, final reports and representations can be viewed on NGENSO's website at: <http://www2.nationalgrid.com/UK/Industry-information/Electricity-codes/Grid-code/Modifications/>

<sup>10</sup> As set out in Standard Condition C14(1)(b) of the Electricity Transmission Licence, available at: <https://epr.ofgem.gov.uk/>

<sup>11</sup> The Authority's statutory duties are wider than matters which the Grid Code Panel Review must take into consideration and are detailed mainly in the Electricity Act 1989 as amended.

NGESO is responsible for moving electricity safely and efficiently through the system by constantly balancing supply and demand. Proposed updates to references to EREC G5 will ensure that consistent arrangements apply at both the transmission and distribution levels. This will standardise requirements across voltage levels, thereby promoting system efficiency. In addition, aligning requirements across the distribution and transmission codes reduces ambiguity and ensures system security.

For the reasons set out above, we consider that the modification proposal will better facilitate Grid Code objective (iii).

***(v) to promote efficiency in the implementation and administration of the Grid Code arrangements***

NGESO maintain and administer the Grid Code. It is also responsible for implementing and ensuring compliance with the requirements set out in the Grid Code. Updating references to EREC G5 in the Grid Code will ensure that the correct and most updated technical standards are adopted when users apply to connect to and use the NETS. This promotes efficiency in how NGENO execute its role.

For the reasons set out above, we consider that the modification proposal will better facilitate Grid Code objective (v).

**Decision notice**

In accordance with Standard Condition C14 of the Transmission Licence, the Authority hereby directs that Grid Code modification proposal Grid Code GC0129: "Updating the Grid Code to use Engineering Recommendation G5/5 – Harmonics" be made.

**Martin Queen**

**Principal Engineer – Systems & Networks**

Signed on behalf of the Authority and authorised for that purpose